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(54) **Dust bag and method for manufacturing the same**

Saubsaugerbeutel und Verfahren zur Herstellung desselben

Sac à poussières et procédé pour le fabriquer

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- **PATENT ABSTRACTS OF JAPAN** vol. 1996, no. 06, 28 June 1996 (1996-06-28) -& JP 08 038402 A (SANYO ELECTRIC CO LTD), 13 February 1996 (1996-02-13)
- **PATENT ABSTRACTS OF JAPAN** vol. 1996, no. 06, 28 June 1996 (1996-06-28) -& JP 08 038403 A (SANYO ELECTRIC CO LTD), 13 February 1996 (1996-02-13)

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**EP 1 059 056 B1**

## Description

[0001] The invention relates to dust bags to be used primarily in vacuum cleaners. More particularly, the invention refers to dust bags provided with an intake opening for receiving a socket piece of a vacuum cleaner or the like. Further, the invention relates to methods of producing such dust bags.

[0002] Collection equipment for dust and similar materials, such as vacuum cleaners, requires the use of containers or bags for the material to be collected. These bags can consist of paper or any other filtration type material which on the one hand allows to collect the dust and dust-like material and on the other hand has a porosity sufficient for the fluid carrying the dust or dust-like material to penetrate through the walls of the filter-like material with a minimum pressure drop. The materials are well known to the artisan in the field.

[0003] Typically these dust bags are provided with a single intake opening through which the dust or dust-like material is to be transported and collected within the bag. For a number of reasons, this opening should preferably be reinforced by a suitable means. Most typically this is achieved through the use of a mounting means for mounting the dust bag at the socket piece. Such mounting means or so-called collars have an opening most typically of a circular form which practically corresponds to the opening within the bag. The collar is attached to the bag so that a sealing effect is obtained which prevents the fluid and the dust to pass through openings other than the openings of the dust bag and the collar. The collar consists of a relatively stable material, such as cardboard or plastic.

[0004] EP 0 179 950 describes a dust bag and especially methods for attaching a mounting means in a sealing manner by applying adhesive around the opening within the filter bag. The mounting means is designed to receive a socket piece from which dust is discharged and which can be passed through its opening so that the mounting means is slightly stretched and will be fastened in sealing abutment around the socket piece.

[0005] DE 28 06 305 describes a vacuum cleaner bag having a collar, and methods for manufacturing said bag. Also here a collar is sealingly attached to the bag through the use of an adhesive.

[0006] DE 24 16 079 describes a similar configuration in which dust bags are used that are folded in a special manner and are provided with an opening onto which the collar is attached, again through the use of an adhesive.

[0007] DE 23 10 160 relates to a method in which a hose consisting of the above described filter material is produced in a continuous process wherein pieces of this hose are cut off and their ends are folded and sealed in order to form a completely closed bag. On one side of this bag, an opening for sealing attachment of a collar therein is formed in one layer.

[0008] JP 8-38402 and JP 8-38403 relate to a so-

called three-dimensional bag which has folded wall portions as e.g. illustrated in Fig. 3 of JP 8-38402 which can be obtained from a four-sided bag with open ends wherein two opposing wall portions are folded inwardly. In one of the two other unfolded wall portions an opening is provided onto which a collar can be attached. The two ends are then closed and sealed. The dust bag is folded along a center line extending perpendicularly to the sealed ends through the collar and the opening therein and is formed in one of the wall portions. The collar may extend beyond one of the sealed ends.

[0009] In all of the above mentioned filter bag designs the opening is provided in one of the wall portions of the hose of the filter material established by the wall portions. This provision of the opening is rather complicated to manufacture.

[0010] US 3,751,881 describes a filter bag with two semicircular recesses which are each provided in a wall portion. In an unfolded state the recesses form a circular intake opening. At the outer edge of the filter bag, lugs are provided to be clamped into slots of a mounting means. For this reason, the mounting means comprises an outer and an inner sheet which are fixed to each other. The inner sheet comprises the slots which are arranged at a folding line. To insert the lugs into the slots, the mounting means is folded away from the filter bag to receive the lugs. In the received state, the inner sheet of the mounting means is in direct contact to the outer edge of the filter bag. After clamping the lugs into the slots, the mounting means is folded towards the filter bag to fix the inner sheet to the wall portions.

[0011] Filter bags of the described type are typically disposable items. Therefore, it is essential to minimize both the material consumption and the overall manufacturing cost.

[0012] It is an object of the invention to provide a dust bag and methods to produce dust bags in a simple manner requiring only few manufacturing steps.

[0013] This object is solved by a dust bag according to the features of claim 1 and by methods for manufacturing dust bags according to the features of claims 10 and 12.

[0014] The dust bag comprises at least two wall portions of filter material which in an overlaying state are opposed to each other. The two opposing wall portions are connected to each other at one outer edge of the dust bag. Each wall portion has a recess that is open to the aforementioned edge. The two recesses are identical in shape and size and opposed to each other in the overlaying state. When using the dust bag, the dust bag is unfolded from its overlaying state into an unfolded state. In this state, the two recesses form the intake opening for receiving the socket piece. The remaining edges of the dust bag are also connected to each other. The edges are obtained by connecting two adjacent wall portions and/or by folding the wall portions.

[0015] The intake opening of the dust bag is surrounded by a mounting means for mounting the dust bag to

the socket piece. By insertion of the socket piece into and through the intake opening of the dust bag, the mounting means due to its dimensions can be frictionally seated, thus fixing the dust bag sealingly to the socket piece. The mounting means comprises at least two mounting elements. Each element is fixed to one of the two opposing wall portions and arranged adjacent to the common edge of the two wall portions. Thus, the mounting elements are opposed to each other in the overlaying state. In the unfolded state of the dust bag, the mounting elements are arranged in one plane and form the so-called collar. A sealing element may be arranged e.g. by adherence at the inner edge of the collar for sealing the mounting element to the socket piece.

[0016] The wall portions of the dust bag can be made from a filtering material selected from the group comprising paper, synthetic material, non-woven material, in particular of recyclable polypropylene, as known to someone skilled in the art. Since the recesses are opposed to each other in the overlaying state, they can be cut into the wall portions within one manufacturing step. Each recess forms a half of the intake opening.

[0017] In a preferred embodiment of the dust bag, the two mounting elements are flexibly connected to each other. The two mounting elements are connected e.g. via a thin foil. Preferably, the two mounting elements are connected via a spacer element. The spacer element has a width corresponding to the thickness of the wall portions being arranged between the mounting elements in the overlaying state. Thus, the dust bag is relatively flat in the overlaying state and can be stored easily. The spacer element is flexibly connected to each of the two mounting elements.

[0018] The mounting means can be made of one piece. To provide a mounting means having two flexibly connected mounting elements, the one-piece mounting means can be cut along a symmetry axis wherein the depth of the cut is less than the thickness of the mounting means. Another possibility to manufacture a mounting means out of one piece having two flexibly connected mounting elements is to perforate the mounting means along the symmetry axis. This symmetry axis is in alignment with the common edge of the two wall portions. In both cases described above the one-piece mounting means is provided with a line of weakness and/or a living hinge to facilitate flexibility of the integral connection of the two mounting elements.

[0019] If the two mounting elements are connected via a spacer element, the flexible connection between the mounting elements and the spacer element can also be achieved by the aforementioned cutting process or by perforating, i.e. by providing lines of weakness between each of the mounting elements and the spacer element, respectively.

[0020] In addition, it is possible to fold the wall portions in a manner providing a three-dimensional dust bag. Furthermore, additional wall portions can be used and connected with the two opposing wall portions to

manufacture a three-dimensional dust bag. Each wall portion may comprise one or several layers of gas permeable (filter) material.

[0021] A preferred method for manufacturing dust bags according to the invention comprises the steps of:

- overlaying two wall portions of a filter material such that said wall portions are connected along an outer edge of the bag, and
- cutting recesses into both wall portions within one step, which recesses are open to said outer edge and together form an intake opening.

[0022] After the cutting step, the recesses are surrounded by a mounting means at opposite sides of the wall portions facing away from each other. The mounting means comprises two mounting elements each fixed to one wall portion adjacent to the edges and opposed to each other in the overlaying state of the wall portions. The mounting means having an opening to receive the socket piece can also be fixed to the wall portions before the cutting step is performed. For this purpose, mounting means as described above can be used.

[0023] Another preferred method for manufacturing a dust bag combines the manufacture of the recesses in the mounting means and the cutting of the recesses into both wall portions. Thus, after the step of overlaying two wall portions of filter material as described above, a mounting element is fixed to each of said wall portions at the outer side of each wall portion such that both mounting elements are opposed to each other and arranged adjacent to the outer edge of the wall portions. After this step, recesses are cut into both wall portions and both mounting elements in one step. The recesses are open to the outer edge of the wall portions and form the intake opening. Preferably, the mounting elements are already flexibly connected.

[0024] Within the first step of the two above-described methods it is possible to supply two sheets of filter material separately to form two opposing wall portions. After this supplying step, the outer edges extending in the supply direction can be connected to each other to form a continuous hose or tube of filter material. Thereafter, the recesses are cut into both of the wall portions or into both of the wall portions and the mounting elements. It is also possible to connect the edges extending in the supply direction after the cutting of the recesses. Thereafter, the hose having recesses and, if desired, provided with mounting means if desired, is cut into preferably regular intervals. The thus created two additional open sides are connected such that a bag is obtained which has an essentially rectangular shape with all four sides sealed together.

[0025] Since a hose or tube is easier to handle, the two opposing wall portions are connected to each other along connecting lines which are vertical to the feeding direction before they are cut into dust bags between these two connecting lines. Thus, a bag with all four

sides sealed together is obtained directly after the final cutting step.

[0026] Instead of feeding two sheets of filter material separately to form the two opposing wall portions, it is also possible to feed only one sheet of filter material which is folded to form the two opposing wall portions. The folding line extends in the feeding direction. Thereafter, the dust bag is manufactured by one of the above-described various methods.

[0027] In any of the described methods according to the invention, it is also possible to form a three-dimensional bag by folding the wall portions as desired or by adding additional wall portions.

[0028] Hereinafter are described preferred embodiments of the dust bag and preferred manufacturing methods of the dust bag according to the invention. In the drawing:

- Fig. 1 is a schematical perspective view of a preferred manufacturing method,
- Fig. 2 is a schematical perspective view of a preferred embodiment of the dust bag in its overlaying state,
- Fig. 3 is a schematical perspective view of the dust bag shown in Fig. 2 in its unfolded state,
- Fig. 4 illustrates the steps of another preferred manufacturing process,
- Fig. 5 illustrates the steps of an additional preferred manufacturing process,
- Figs. 6 to 8 are schematical side views of dust bags according to the invention with different kinds of preferred mounting elements, and
- Figs. 9 and 10 illustrate the manufacture of a three-dimensional dust bag according to another preferred embodiment of the invention.

[0029] Fig. 1 shows a preferred manufacturing process. In a continuous process two sheets 10,12 of a single layer or multiple layer filter material of a given width are unrolled from two rolls 14,16. These two sheets 10,12 are then brought together and joined at the two longitudinal outer edges 18,20 through a heat-sealing or ultrasonic welding process by means of a connecting device 22.

[0030] Accordingly, a flat hose is provided, essentially consisting of two wall portions 24,26 of filter material, an upper wall portion 24 and a lower wall portion 26, which are sealingly joined together at their longitudinal sides. A mounting means 28 or so-called collar of a relatively

stable material, either consisting of a piece of cardboard or a plastic material such as polyethylene or polypropylene may be provided with a layer of adhesive which preferably is laminated onto it or over the entire surface of the collar 28. The collar 28 is provided with at least one line of weakness (perforation or cutting line) so that it can be folded. A first mounting element 32, i.e. the first half of the collar 28 is adhered to the upper wall portion 24 along the edge 20 of the bag. A second mounting element 34, i.e. the second half of the collar 28 is folded until it can be adhered to the lower wall portion 26 of the dust bag.

[0031] The collar 28 as well as the underlying wall portions 24,26 of filter material of the bag are then provided with recesses 36 which are semi-circular cuts in the shown manufacturing process. Within the next method step, the two filter wall portions 24,26 are perpendicular to each other along connecting lines 38,40 which are vertical to the supply direction. Thus, all four edges of the dust bag are connected to each other. Then, in regular intervals of the desired length of the dust bag, the two opposing wall portions 24,26 are cut along a cutting line 42 to obtain dust bags 44 as shown in Fig. 2. The dust bag with collar 28 is now ready for use. The two mounting elements 32,34 of the mounting means 28 can be unfolded until they are brought into an essentially flat form (Fig. 3) wherein the recesses of the mounting elements 32,34 form the intake opening 45. The dust bag then automatically unfolds itself and forms a complete bag as shown in Fig. 3. If the dust bag 44 is used, it stays open in its unfolded state.

[0032] The continuous hose or tube can be separated into pieces with a straight cut, and further with a cutting tool that provides a rounded edge on the sides. Accordingly some material of the filter has to be discarded. Similarly such cut can also be provided at the longitudinal edges 18,20. In this case, however, it has to be ensured that the sealing or welding process is performed after the cutting. By these or similar methods a whole variety of configurations can be obtained, such as e.g. a trapezoidal or even an elliptical or round bag. However, there may be configurations where it is still more advantageous to produce a bag in this manner.

[0033] The collar 28 itself can have any shape according to the requirements for the intended use. For example, it can be essentially rectangular, round or elliptical.

[0034] Fig. 4 shows another preferred manufacturing method for manufacturing a dust bag. Herein the two recesses 36a and 36b which are cut in the two opposing wall portions 24,26 are cut in these wall portions 24,26 before a mounting means 28 is fixed on the two wall portions 24,26. In the next step, the mounting means 28 is fixed on the two opposing wall portions 24,26. Within the next step, recesses 36c and 36d are cut into both mounting elements 32,34 of the mounting means 28. The obtained dust bag 44 is identical with the dust bag manufactured according to the process described in Fig. 1.

[0035] The basic feature of the collar 28 is that for its

intended use it must be brought into an essentially flat configuration and it has to be given inherent stability to be intrinsically stable. This, however, can also be achieved by using separated mounting elements 32,34 which are applied to the two wall portions 24,26 of the dust bag completely independently as depicted in Fig. 5. The two mounting elements 32,34 are then connected through the filter material as such, which in certain applications may be sufficient. However, it may be advisable to adhere an additional layer of flexible or elastic material between the mounting elements 32,34 of the collar 28 and the bag 44.

[0036] It is essential that the collar 28 is adhered to the bag in a sealing manner. However, it is not necessary to apply adhesive over the entire surface. For example, adhesive may be applied only in an inner circle while the outer portion is free of adhesive. This may be advantageous when it is necessary to insert the collar into a holding means of the vacuum cleaner. Alternatively, strips of adhesive material are applied onto the upper and lower side of the dust bag, the strip for example being a piece of a so-called transfer tape. Transfer tape on a liner is applied onto the bag whereupon the liner is removed.

[0037] Fig. 6 shows an example where the two mounting elements 32,34 are completely separated from each other and only connected by the two wall portions 24,26 along the common edge 20 of the two wall portions 24,26. An alternative is shown in Fig. 7 wherein the two mounting elements 32,34 are integrally connected with each other via a flexible element such as a living hinge 46 or the like. The preferred alternative is shown in Fig. 8 where the collar 28 preferably consists of a plastic material which is provided with two cuts which only penetrate partially into the material so that essentially two hinges 48,50 are formed. Two hinges 48,50 are preferred to a single one as the width of the dust bag is better accommodated by the distance between the two adjacent hinges 48,50. Thus, a spacer element 52 arranged between the two mounting elements 32,34 has a width corresponding to the thickness of the wall portions 24,26 arranged between the mounting elements 32,34 in the overlaying state.

[0038] The intake opening receiving the socket piece can have any suitable form, e.g. the form of a cross. Other configurations can be contemplated, such as a rectangular opening, an elliptical one or anything else. It has to be ensured that in all cases it is possible to open the two elements 32,34 of the collar 28 after assembly so that they form an essentially flat configuration.

[0039] While the flat bags appear to be a particularly preferred configuration due to their simplicity and thus relatively low cost, also other configurations of so-called three-dimensional bags 44' as shown in Figs. 9 and 10 are possible. The two wall portions 54,56 can be brought into a configuration so that opposing folds 58,60 inwardly directly are obtained. After cutting off the individual bag, the two ends 62 are sealed together in essentially

the same manner as described above to form an outer edge 64 of the three-dimensional bag 44'. Recesses 66 are cut in both of the wall portions 54,56 with both recesses 66 being open to the outer edge 64 forming an intake opening 70. Thereafter, the collar 68 is attached to the wall portions 54,56 as explained above in connection with the other embodiments. As an alternative, first the collar 68 can be mounted to the wall portions 54,56 extending along the outer edge 64 so that upon forming recesses 66 in the wall portions 54,56, recesses are formed simultaneously also in the collar 68 to create the intake opening 70.

[0040] It should, however, be ensured that the internal folds 58,60 of the dust bag 44' do not get in touch with each other because it is necessary that in the area of the opening of the collar only one upper and one lower wall portion 54,56 is obtained because otherwise the desired opening cannot be easily generated or the unfolding of the bag would be inhibited (Fig. 10).

[0041] According to another embodiment which would allow one to produce a bag in a particularly simple manner, the two opposing wall portions are formed by a single sheet of material, which is folded onto itself with the folding line extending in the feeding direction and defining an outer edge of the dust bag. Then, the sheet is joined together only at the other outer edge. The bag may then be produced in the same manner as depicted in Fig. 1.

## Claims

1. A dust bag for collecting dust-like material, particularly for vacuum cleaners, with at least two opposing wall portions (24,26) of filter material and with an intake opening, wherein

- said two wall portions (24,26) are connected to each other and define a smooth outer edge (20) of the dust bag,
- said wall portions (24,26) each have a recess (36a,36b) open to said smooth outer edge (20),
- the recesses (36a,36b) of said wall portions (24,26) are identical in shape and size and opposed to each other in the overlaying state of said wall portions,
- said two recesses (36a,36b) of said wall portions (24,26) form said intake opening (45) and
- said intake opening (45) is surrounded by a mounting means (28) for mounting the dust bag at the socket piece from which the dust-like material is discharged, said mounting means (28) comprises at least two mounting elements (32,34) each being fixed to one of said two wall portions (24,26) while arranged adjacent to said smooth outer edge (20) and opposed to each other.

2. The dust bag according to claim 1 **characterized in that** the two mounting elements (32,34) are flexibly connected to each other.
3. The dust bag according to claim 1 or 2 **characterized in that** the two mounting elements (32,34) are connected to each other via a spacer element (52) wherein the width of said spacer element (52) corresponds to the thickness of the wall portions (24,26) being arranged between the mounting elements (32,34) in the overlaying state.
4. The dust bag according to claim 3 **characterized in that** the spacer element (52) is flexibly connected to said two mounting elements (32,34).
5. The dust bag according to any one of claims 1 to 4 **characterized in that** the mounting means (28) is made of one piece.
6. The dust bag according to claim 5 **characterized in that** said mounting means (28) comprises a line of weakness along a symmetry axis (30) being in alignment with said outer edge (20).
7. The dust bag according to any one of claims 1 to 5, **characterized in that** at least one of said wall portions (54,56) is additionally folded to form a three-dimensional dust bag.
8. The dust bag according to any one of claims 1 to 7 **characterized in that** said mounting means (28) is made of cardboard or plastic especially polyethylene or polypropylene.
9. The dust bag according to any one of claims 1 to 8 **characterized in that** said mounting means (28) is adhered to said wall portions (24,26) preferably by use of an adhesive.
10. A method for manufacturing dust bags for collecting dust-like material, particularly for vacuum cleaners, comprising the steps of:
- overlaying two wall portions (24,26) of a filter material such that said wall portions (24,26) are connected along a smooth outer edge of the bag,
  - cutting recesses (36a,36b) into both wall portions (24,26) within one step which recesses (36a,36b) are open to said smooth outer edge and together form an intake opening (45) and
  - surrounding the recesses (36a,36b) of said wall portions (24,26) with a mounting means (28) at opposite sides of said wall portions (24,26) facing away from each other wherein the mounting means (28) comprises two mounting elements (32,34) each fixed to one wall portion (24,26)
- adjacent to said smooth outer edge (20) and opposed to each other in the overlaying state of the wall portions (24,26).
11. A method for manufacturing dust bags particularly for vacuum cleaners, comprising the steps of:
- overlaying two wall portions (24,26) of a filter material such that said wall portions (24,26) are connected along a smooth outer edge (20) of the bag, and
  - fixing a mounting element (32,34) to each of said wall portions (24,26) at the outer sides such that the mounting elements (32,34) are opposed to each other and arranged adjacent to said smooth outer edge (20) of said wall portions (24,26), and
  - cutting recesses (36) into both wall portions (24,26) and both mounting elements (32,34) within one step which recesses (36) are open to said outer edge (20) and form an intake opening (45).
12. The method according to any one of claims 10 or 11, wherein in the first step two sheets (10,12) of filter material are fed separately and connected to each other to form said two opposing wall portions (24,26) with said outer edge (20).
13. The method according to any one of claims 10 or 11, wherein in the first step only one sheet is fed that is folded to form said two opposing wall portions (24,26) with the folding line extending in the feeding direction.
14. The method according to claim 12 or 13, wherein at least one of said sheets (10,12) is additionally folded to form a three-dimensional dust bag.
15. The method according to any one of claims 10 to 14, wherein the wall portions (24,26) are cut so as to form dust bags after the last step of claim 11 and 14, respectively.
16. The method according to claim 15, wherein said two opposing wall portions (24,26) are connected to each other along two connecting lines (38,40), respectively, which are perpendicular to the feeding direction and between which connecting lines (38,40) the wall portions (24,26) are cut so as to form dust bags.
17. The method according to claim 16, wherein said recesses (36) are cut simultaneously into two adjacent dust bags prior to separating the wall portions (24,26) into dust bags.
18. The method according to any one of claims 15 to

17, wherein all unconnected outer edges of the dust bag are connected prior to separating the wall portions (24,26) into dust bags.

19. The method according to any one of claims 15 to 18, wherein the connection of the wall portions (24,26) is performed by heat-sealing or ultrasonic welding or adhering through an adhesive.
20. The method according to any one of claims 10 to 19, wherein said mounting means (28) and, respectively, said mounting elements (32,34) as characterized in claims 2 to 9 are used.

#### Patentansprüche

1. Staubbeutel zum Sammeln von staubähnlichem Material, insbesondere für Staubsauger, mit mindestens zwei gegenüberliegenden Wandabschnitten (24, 26) aus Filtermaterial und mit einer Einlaßöffnung, wobei die zwei Wandabschnitte (24, 26) miteinander verbunden sind und eine glatte äußere Kante (20) des Staubbeutels definieren, die Wandabschnitte (24, 26) jeweils eine zur glatten äußeren Kante (20) hin offene Ausnehmung (36a, 36b) haben, die Ausnehmungen (36a, 36b) der Wandabschnitte (24, 26) in Form und Größe identisch sind und im übereinanderliegenden Zustand der Wandabschnitte einander gegenüberliegen, die zwei Ausnehmungen (36a, 36b) der Wandabschnitte (24, 26) die Einlaßöffnung (45) bilden und die Einlaßöffnung (45) von einem Montagemittel (28) umgeben ist, um den Staubbeutel am Muffenteil, aus dem das staubähnliche Material ausgetragen wird, zu montieren, wobei das Montagemittel (28) mindestens zwei Montageelemente (32, 34) aufweist, von denen jedes an einem der zwei Wandabschnitte (24, 26) fixiert ist, wobei die Montageelemente angrenzend an die glatte äußere Kante (20) und einander gegenüberliegend vorgesehen sind.
2. Staubbeutel nach Anspruch 1, **dadurch gekennzeichnet, daß** die zwei Montageelemente (32, 34) flexibel miteinander verbunden sind.
3. Staubbeutel nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** die zwei Montageelemente (32, 34) über ein Abstandselement (52) miteinander verbunden sind, wobei die Breite des Abstandselements (52) der Dicke der zwischen den Montageelementen (32, 34) im übereinanderliegenden Zustand vorgesehenen Wandabschnitte (24, 26) entspricht.
4. Staubbeutel nach Anspruch 3, **dadurch gekennzeichnet, daß** das Abstandselement (52) mit den zwei Montageelementen (32, 34) flexibel verbunden ist.
5. Staubbeutel nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, daß** das Montagemittel (28) aus einem Teil hergestellt ist.
6. Staubbeutel nach Anspruch 5, **dadurch gekennzeichnet, daß** das Montagemittel (28) eine Schwächungslinie entlang einer Symmetrieachse (30) in Ausrichtung mit der äußeren Kante (20) aufweist.
7. Staubbeutel nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, daß** mindestens einer der Wandabschnitte (54, 56) zusätzlich gefaltet ist, um einen dreidimensionalen Staubbeutel zu bilden.
8. Staubbeutel nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, daß** das Montagemittel (28) aus Pappe oder Kunststoff, insbesondere Polyethylen oder Polypropylen, hergestellt ist.
9. Staubbeutel nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, daß** das Montagemittel (28) an den Wandabschnitten (24, 26), vorzugsweise mittels eines Klebstoffs, anhaftet.
10. Verfahren zur Herstellung von Staubbeuteln zur Aufnahme von staubähnlichem Material, insbesondere für Staubsauger, wobei das Verfahren die folgenden Schritte aufweist:
  - Übereinanderlegen zweier Wandabschnitte (24, 26) aus einem Filtermaterial, derart, daß die Wandabschnitte (24, 26) entlang einer glatten äußeren Kante des Beutels verbunden werden,
  - Einschneiden von Ausnehmungen (36a, 36b) in die beiden Wandabschnitte (24, 26) innerhalb eines Schritts, wobei die Ausnehmungen (36a, 36b) zur glatten äußeren Kante hin offen sind und gemeinsam eine Einlaßöffnung (45) bilden, und
  - Umgeben der Ausnehmungen (36a, 36b) der Wandabschnitte (24, 26) mit einem Montagemittel (28) an gegenüberliegenden Seiten der Wandabschnitte (24, 26), die voneinander abgewandt sind, wobei das Montagemittel (28) zwei Montageelemente (32, 34) aufweist, die jeweils an einem Wandabschnitt (24, 26) angrenzend an die glatte äußere Kante (20) fixiert und im übereinanderliegenden Zustand der Wandabschnitte (24, 26) einander gegenüberliegend vorgesehen werden.
11. Verfahren zur Herstellung von Staubbeuteln, insbe-

sondere für Staubsauger, wobei das Verfahren die folgenden Schritte umfaßt:

Übereinanderlegen zweier Wandabschnitte (24, 26) aus einem Filtermaterial, derart, daß die Wandabschnitte (24, 26) entlang einer glatten äußeren Kante (20) des Beutels verbunden werden, und

Fixieren eines Montageelements (32, 34) an jedem der Wandabschnitte (24, 26) an den äußeren Seiten, derart, daß die Montageelemente (32, 34) einander gegenüberliegend und angrenzend an die glatte äußere Kante (20) der Wandabschnitte (24, 26) vorgesehen werden, und

Einschneiden von Ausnehmungen (36) in die beiden Wandabschnitte (24, 26) und in die beiden Montageelemente (32, 34) innerhalb eines Schritts, wobei die Ausnehmungen (36) zur äußeren Kante (20) hin offen sind und eine Einlaßöffnung (45) bilden.

12. Verfahren nach einem der Ansprüche 10 oder 11, wobei im ersten Schritt zwei Bahnen (10, 12) aus Filtermaterial separat zugeführt und miteinander verbunden werden, um die zwei gegenüberliegenden Wandabschnitte (24, 26) mit der äußeren Kante (20) zu bilden.

13. Verfahren nach einem der Ansprüche 10 oder 11, wobei im ersten Schritt nur eine Bahn zugeführt wird, die gefaltet wird, um die zwei gegenüberliegenden Wandabschnitte (24, 26) mit der in der Zuführungsrichtung verlaufenden Faltlinie zu bilden.

14. Verfahren nach Anspruch 12 oder 13, wobei mindestens eine der Bahnen (10, 12) zusätzlich gefaltet wird, um einen dreidimensionalen Staubbeutel zu bilden.

15. Verfahren nach einem der Ansprüche 10 bis 14, wobei die Wandabschnitte (24, 26) so zugeschnitten werden, daß sie nach dem letzten Schritt des Anspruchs 11 bzw. 14 Staubbeutel bilden.

16. Verfahren nach Anspruch 15, wobei die zwei gegenüberliegenden Wandabschnitte (24, 26) an zwei Verbindungslinien (38 bzw. 40) entlang, die senkrecht zur Zuführungsrichtung verlaufen, miteinander verbunden und die Wandabschnitte (24, 26) zwischen diesen Verbindungslinien (38, 40) so zugeschnitten werden, daß sie Staubbeutel bilden.

17. Verfahren nach Anspruch 16, wobei die Ausnehmungen (36) gleichzeitig in zwei angrenzende Staubbeutel eingeschnitten werden, bevor die Wandabschnitte (24, 26) in Staubbeutel getrennt werden.

18. Verfahren nach einem der Ansprüche 15 bis 17, wobei alle nicht verbundenen äußeren Kanten des Staubbeutels verbunden werden, bevor die Wandabschnitte (24, 26) in Staubbeutel getrennt werden.

19. Verfahren nach einem der Ansprüche 15 bis 18, wobei das Verbinden der Wandabschnitte (24, 26) durch thermisches Schweißen oder Ultraschallschweißen oder Verkleben mittels eines Klebstoffs vorgenommen wird.

20. Verfahren nach einem der Ansprüche 10 bis 19, wobei das Montagemittel (28) bzw. die Montageelemente (32, 34), wie in den Ansprüchen 2 bis 9 definiert, verwendet werden.

#### Revendications

1. Sac à poussière pour la collecte de matières telles que la poussière, destiné particulièrement aux aspirateurs, avec au moins deux parties de parois opposées (24, 26) en matériau filtrant et avec une ouverture d'admission dans lequel :

- lesdites deux parties de parois (24, 26) sont connectées l'une à l'autre et définissent un bord extérieur lisse (20) du sac à poussière,
- lesdites parties de parois (24, 26) comportent chacune une découpe (36a, 36b) débouchant sur ledit bord extérieur lisse (20),
- les découpes (36a, 36b) desdites parties de parois (24, 26) sont de taille et de forme identiques et opposées l'une à l'autre dans l'état de chevauchement desdites parties de parois,
- lesdites deux découpes (36a, 36b) desdites parties de parois (24, 26) forment ladite ouverture d'admission (45) et
- ladite ouverture d'admission (45) est entourée par un moyen de fixation (28) pour fixer le sac à poussière à la partie de cavité de laquelle la matière telle que la poussière est déchargée, ledit moyen de fixation (28) comprenant au moins deux éléments de fixation (32, 34) qui sont chacun fixés à une desdites deux parties de parois (24, 26) tout en étant agencés en position adjacente auxdits bords extérieurs lisses (20) et opposés l'un à l'autre.

2. Sac à poussière selon la revendication 1, caractérisé en ce que les deux éléments de fixation (32, 34) sont connectés de façon flexible l'un à l'autre.

3. Sac à poussière selon la revendication 1 ou 2, caractérisé en ce que les deux éléments de fixation (32, 34) sont connectés l'un à l'autre par l'intermédiaire d'un élément d'entretoise (52) dans lequel la largeur dudit élément d'entretoise (52) correspond



à l'épaisseur des parties de parois (24, 26) qui sont agencées entre les éléments de fixation (32, 34) dans l'état de chevauchement.

4. Sac à poussière selon la revendication 3, **caracté-**  
**risé en ce que** l'élément d'entretoise (52) est con-  
necté de façon flexible auxdits deux éléments de  
fixation (32, 34).

5. Sac à poussière selon l'une quelconque des reven-  
dications 1 à 4, **caractérisé en ce que** le moyen de  
fixation (28) est fabriqué d'une seule pièce.

6. Sac à poussière selon la revendication 5, **caracté-**  
**risé en ce que** ledit moyen de fixation (28) com-  
prend une ligne de faiblesse le long d'un axe symé-  
trique (30) qui est en alignement avec ledit bord ex-  
térieur (20).

7. Sac à poussière selon l'une quelconque des reven-  
dications 1 à 5, **caractérisé en ce qu'**au moins une  
desdites parties de parois (54, 56) est en outre pliée  
pour former un sac à poussière à trois dimensions.

8. Sac à poussière selon l'une quelconque des reven-  
dications 1 à 7, **caractérisé en ce que** ledit moyen  
de fixation (28) est fabriqué en carton ou en plasti-  
que et spécialement en polyéthylène ou en polypro-  
pylène.

9. Sac à poussière selon l'une quelconque des reven-  
dications 1 à 8, **caractérisé en ce que** ledit moyen  
de fixation (28) est collé auxdites parties de parois  
(24, 26) préféablement à l'aide d'un adhésif.

10. Procédé pour fabriquer des sacs à poussière des-  
tinés à la collecte de matières telles que la poussière,  
destinés particulièrement aux aspirateurs, com-  
prenant les étapes suivantes :

- chevauchement de deux parties de parois (24, 26) de matériau filtrant de telle façon que lesdites parties de parois (24, 26) sont connectées le long d'un bord extérieur lisse du sac,
- aménagement de découpes (36a, 36b) dans les deux parties de parois (24, 26) en une étape dans laquelle les découpes (36a, 36b) débouchent sur ledit bord extérieur lisse et forment avec celui-ci une ouverture d'admission (45) et
- encerclement des découpes (36a, 36b) desdites parties de parois (24, 26) avec un moyen de fixation (28) à des côtés opposés desdites parties de parois (24, 26) faisant face à l'opposé l'une de l'autre, dans lequel le moyen de fixation (28) comprend deux éléments de fixation (32, 34) fixés chacun à une partie de paroi (24, 26) en position adjacente audit bord extérieur lisse (20) et opposés l'un à l'autre dans l'état de

chevauchement des parties de parois (24, 26).

11. Procédé pour fabriquer des sacs à poussière des-  
tinés particulièrement aux aspirateurs, comprenant  
les étapes suivantes :

- chevauchement de deux parties de parois (24, 26) de matériau filtrant de telle façon que lesdites parties de parois (24, 26) sont connectées le long d'un bord extérieur lisse (20) du sac,
- fixation d'un élément de fixation (32, 34) à chacune desdites parties de parois (24, 26) aux côtés extérieurs de telle façon que les éléments de fixation (32, 34) sont opposés l'un à l'autre et agencés en position adjacente audit bord extérieur lisse (20) desdites parties de parois (24, 26), et
- aménagement de découpes (36) dans les deux parties de parois (24, 26) et les deux éléments de fixation (32, 34) dans une même étape, lesdites découpes (36) débouchant sur ledit bord extérieur (20) et formant une ouverture d'admission (45).

12. Procédé selon l'une quelconque des revendications 10 ou 11, dans lequel à la première étape deux feuilles (10, 12) de matériau filtrant sont alimentées séparément et connectées l'une à l'autre pour former lesdites deux parties de parois opposées (24, 26) avec ledit bord extérieur (20).

13. Procédé selon l'une quelconque des revendications 10 ou 11, dans lequel à la première étape seulement une feuille est alimentée et est pliée pour former lesdites deux parties de parois opposées (24, 26) avec la ligne de pliage s'étendant dans la direction d'alimentation.

14. Procédé selon la revendication 12 ou 13, dans lequel au moins une desdites feuilles (10, 12) est en outre pliée pour former un sac à poussière à trois dimensions.

15. Procédé selon l'une quelconque des revendications 10 à 14, dans lequel les parties de parois (24, 26) sont découpées de manière à former les sacs à poussière après la dernière étape de la revendication 11 et 14, respectivement.

16. Procédé selon la revendication 15, dans lequel lesdites deux parties de parois opposées (24, 26) sont connectées l'une à l'autre le long de deux lignes de connexion (38, 40), respectivement, qui sont perpendiculaires à la direction d'alimentation et entre lesquelles lignes de connexion (38, 40) les parties de parois (24, 26) sont découpées de manière à former les sacs à poussière.

17. Procédé selon la revendication 16, dans lequel les-  
dites découpes (36) sont taillées simultanément  
dans deux sacs à poussière adjacents avant la sé-  
paration des parties de parois (24, 26) pour former  
les sacs à poussière. 5
18. Procédé selon l'une quelconque des revendications  
15 à 17, dans lequel tous les bords extérieurs non  
connectés du sac à poussière sont connectés avant  
la séparation des parties de parois (24, 26) en sacs 10  
à poussière.
19. Procédé selon l'une quelconque des revendications  
15 à 18, dans lequel la connexion des parties de  
parois (24, 26) est effectuée par thermoscellage ou 15  
par soudage ultrasonique ou par collage au moyen  
d'un adhésif.
20. Procédé selon l'une quelconque des revendications  
10 à 19, dans lequel sont utilisés ledit moyen de 20  
fixation (28) et, respectivement, lesdits éléments de  
fixation (32, 34) tels qu'ils sont caractérisés dans  
les revendications 2 à 9.

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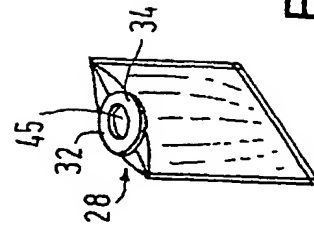
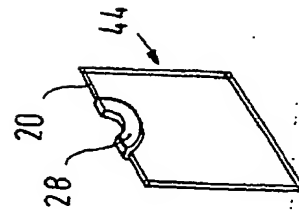
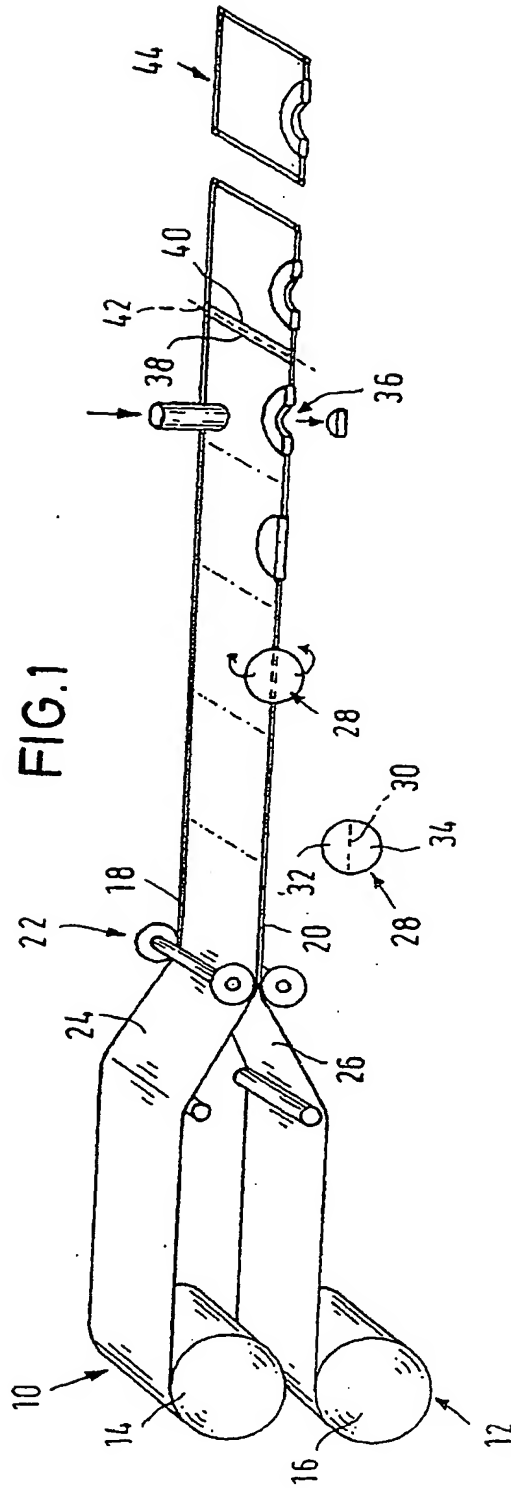
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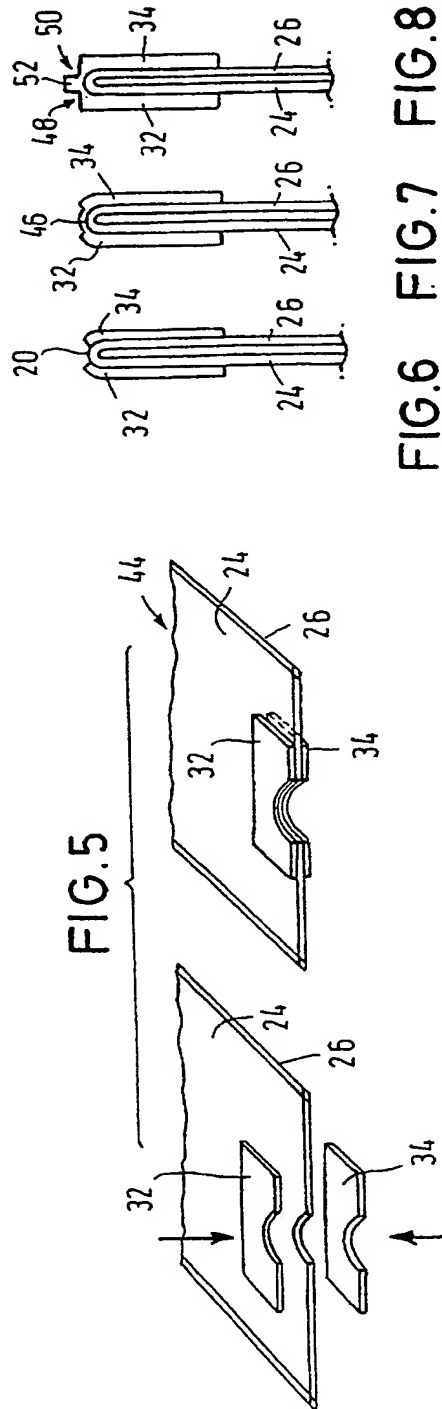
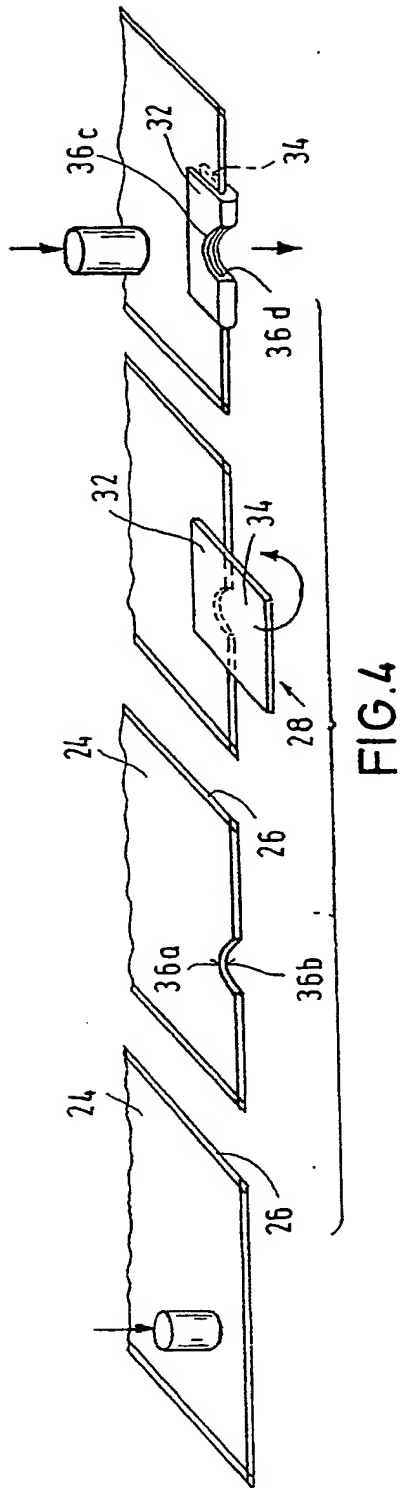
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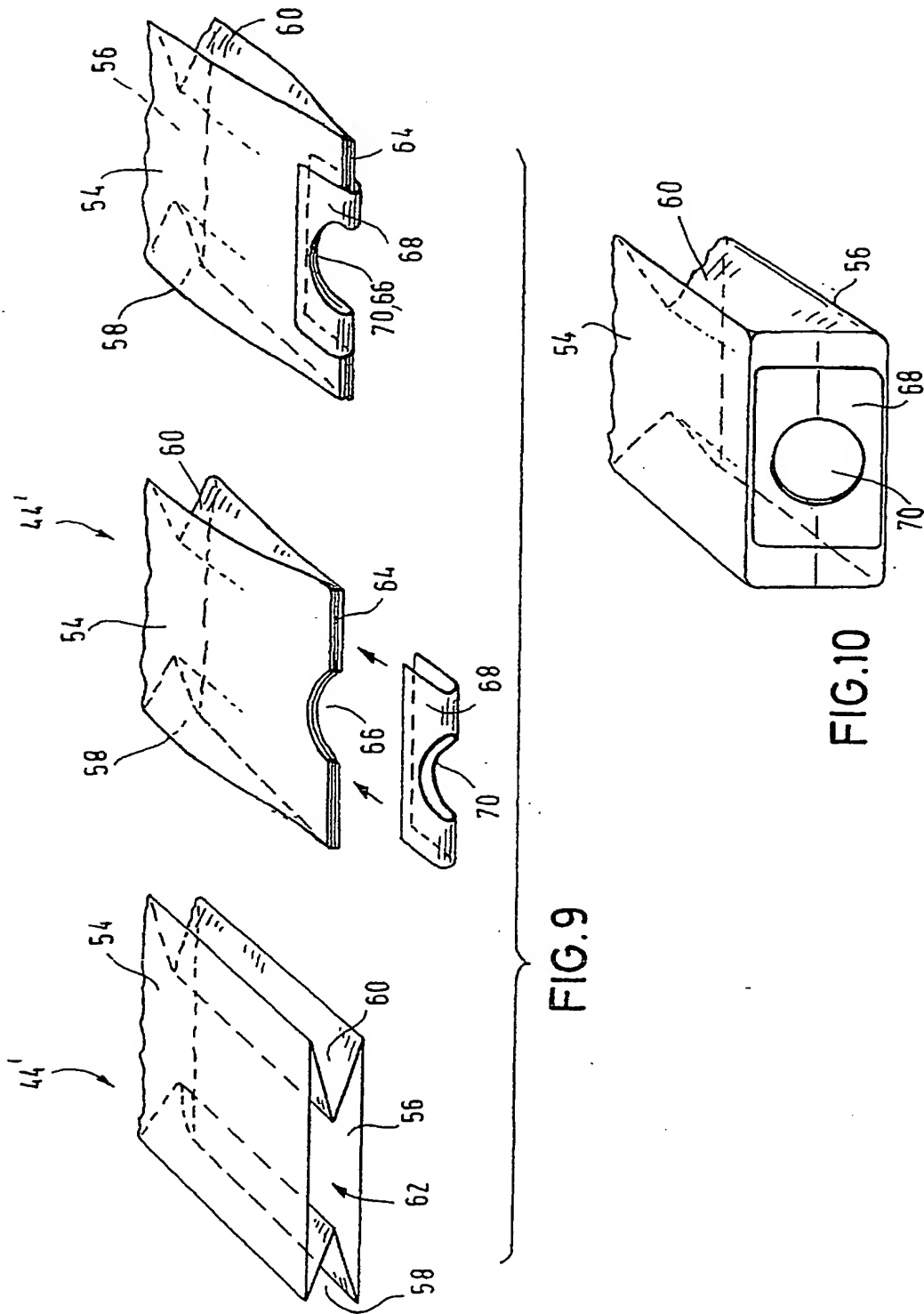


FIG.9

FIG.10

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